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| 09/997,626 | 11/28/2001 | Edward T. Sullivan | 064731.0292 | 7607 |

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| EXAMINER | |
|---|---|
| ALEXANDER, JESSE NELSON | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2666 | |

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/997,626 | SULLIVAN ET AL. | |
| | Examiner | Art Unit | |
| | Jesse N. Alexander | 2666 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,10,14-32* is/are rejected.

7)☒ Claim(s) *5-9 and 11-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 November 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because of the following informalities:

- The title of the invention appears the abstract paragraph and should be deleted.
- It is suggested that sentence "An interface controller is stored in a storage medium of the network element." Be changed to "Software for an interface controller is stored in a storage medium of the network element.

Appropriate correction is required.

### *Drawings*

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: $P_{16\text{-}1}...P_{16\text{-}4}$ . Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified

and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

3. Claims 1, 10 and 25 are objected to because of the following informalities: The interface controller (software) can only be embodied in memory as machine-readable code executed by a CPU or controller.

Regarding claim 1, it is recommended that the phrase "stored in the storage medium the interface controller" be removed from line 10 of claim 1.

Regarding claim 10, it is recommended that the phrase "an interface controller stored in the storage medium, the" be replaced with the word –a-- in lines 11 through 12.

Regarding claim 25, it is recommended that the word –transmit-- be added between the words "to" and "a" in line 2.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 21-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 21 recites the limitations "the port" in line 5 and "the map" in line 6. There are insufficient antecedent bases for these limitations in the claim.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1, 2, 3, 4, 10, 14, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Prasad (US 6,381,214 B1).

**Regarding claims 1, 4, 10, 14, and 19** Prasad discloses a network element for a telecommunications network **(element 24, fig. 2)**, and a telecommunications system, comprising: a first network element **(ATM switch element $28_1$)** coupled to a remote

second network element **(ATM switch element $28_0$)** via a transmission line; comprising: a port for connection to a transmission line of a telecommunications network **(PHY elements $39_o$ through $39_k$ of fig. 3b)**; a plurality of transmission line interfaces **(an ATM switch inherently supports telephony and has a plurality of line cards, see Prasad (US 6,381,216 B1) fig. 2)**, the transmission line interfaces each including a scheduler to transmit traffic in port transmission slots allocated to the transmission line interface **(element 33 policy/shaper in fig. 3b is interchangeable with scheduler 33 in fig. 3a as stated in col. 13, lines 28-31)**; a storage medium; and an interface controller stored in the storage medium, the interface controller operable to selectively couple transmission line interfaces to the port and to allocate a disparate portion of port transmission slots to each of the transmission line interfaces coupled to the port **(controllers and associated memory or storage media are inherently comprised in ATM switches, see again Prasad (US 6,381,216 B1) fig. 2, elements 14 and 15, respectfully)**.

**Regarding claims 2, and 3,** network element further comprising: plurality of ports for connection to disparate transmission lines of the telecommunications network **( ATM ports or links connected to $39_o$ through $39_k$ of fig. 3b)**; the interface controller operable selectively couple at least two of the transmission line interfaces to each port and, for each port, allocate disparate portion of port transmission slots each of the transmission line interfaces coupled to the port **(controllers and associated memory or storage media are inherently comprised in ATM switches, see again Prasad (US 6,381,216 B1) fig. 2, elements 14 and 15, respectfully)**.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 15, 17, 18, 20-22, 24-32, are rejected under 35 U.S.C. 103(a) as being unpatentable over Prasad (US 6,381,214 B1) in view of Carr et al. (US 6,643,293 B1).

**Regarding claims 15, 16, 17, 18, 25, 26, 27, 28,** Prasad discloses a propagated signal embodied in a transmission media **(physical links col. 9, lines 35-40)**, comprising: a virtual tunnel comprising **(virtual tunnels or channels col. 3, lines 38-42)**; a predefined portion of a bandwidth of the transmission media **(traffic contracts for channel or virtual tunnel include bandwidth parameters such as Peak Cell Rate and Sustainable Cell Rate, etc. col. 3, lines 38-42 and col. 10, lines 34-39)**.

Prasad fails to teach, dynamic traffic propagated in the virtual tunnel.

Carr et al. teaches the concepts of dynamic or non-real time (ABR and UBR, i.e. email, WWW, etc.), and dedicated or real-time (CBR, and real-time VBR, voice, video, etc.) ATM traffic propagated via a virtual path in **col. 3, lines 51-65 and in fig. 7 and 8, elements 36, respectively**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Prasad with those of Carr et al. The

motivation being to allow the ATM switch to support all traffic service categories, as taught by Carr et al.

**Regarding claim 20,** Prasad teaches a method further comprising queuing traffic for each scheduler in element 43 and 41, fig. 3b.

Prasad fails to explicitly teach a method further comprising separately queuing traffic for each scheduler.

Carr et al. teaches the concept of separately queuing by traffic service group in fig. 4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Prasad with those of Carr et al. The motivation being to insure that each traffic from each service class is fairly allocated bandwidth during aggregation, as taught by Carr et al. in col. 2, lines 20-26.

**Regarding claims 21, 22,** Prasad teaches a method for transmitting traffic in a virtual tunnel of a transmission line **(virtual tunnels or channels col. 3, lines 38-42)**, comprising: receiving a request to transmit specified traffic in a virtual tunnel having a bandwidth **(traffic contracts or requests for channel or virtual tunnel include bandwidth parameters such as Peak Cell Rate and Sustainable Cell Rate, etc. col. 3, lines 38-42 and col. 10, lines 34-39)**; coupling a scheduler to the port **(ports or links are coupled to element 33 policy/shaper in fig. 3b which, is interchangeable with scheduler 33 in fig. 3a as stated in col. 13, lines 28-31)**.

Prasad teaches a method further comprising coupling a queue to the scheduler to queue the specified traffic for transmission by the scheduler in element 43 and 41, fig. 3b.

Prasad fails to teach identifying from the map a hierarchical set of port transmission slots providing at least the bandwidth; allocating the hierarchical set of port transmission slots to the scheduler; and using the scheduler to transmit the specified traffic in the hierarchical set of port transmission slots.

Carr et al. teaches the concept of a hierarchical scheduler/arbitrator in fig. 4 capable to transmit the specified traffic in the hierarchical set of port transmission slots.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Prasad with those of Carr et al. The motivation being to provide a fair method of aggregating virtual channels connections with different categories of service into a common path, as taught by Carr et al. in col. 2, lines 20-26.

**Regarding claim 24,** Prasad teaches a method further comprising using the scheduler to transmit specified dynamic traffic in the transmission slots **(dynamic ABR/UBR traffic, col. 3, lines 51-65)**.

Prasad fails to teach using the scheduler to transmit hierarchical specified dynamic traffic in the set of transmission slots.

Carr et al. teaches the concept of a hierarchical scheduler/arbitrator in fig. 4 capable to transmit the specified traffic in the hierarchical set of port transmission slots.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Prasad with those of Carr et al. The motivation being to provide a fair method of aggregating virtual channels connections with different categories of service into a common path, as taught by Carr et al. in col. 2, lines 20-26.

**Regarding claims 29, 30, and 31** Prasad fails to explicitly teach the virtual tunnel comprising a plurality of substantially evenly spaced transmission slots of the transmission media.

Carr et al. teaches in the concept of a virtual tunnel or path comprising aggregate streams shown in fig. 4 (as compared with fig. 1) with substantially evenly spaced transmission slots of the transmission media. Carr et al also teaches in fig. 4 the concept of transmission slots interleaved in accordance with their service categories.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Prasad with those of Carr et al. such that aggregate transmission slots are evenly spaced and interleaved. The motivation being to shape the aggregate traffic so that all available bandwidth is used efficiently in accordance with Carr et al.'s teaching.

**Regarding claim 32**, Prasad fails to explicitly teach the propagated signal in which at least two of the virtual tunnels comprising disparate bandwidths of the transmission media.

Carr et al. teaches in network of fig. 3 the concept of a plurality of disparate VCCs aggregating at an aggregation point. Carr et al. teaches further in fig. 4 that said disparate, component VCCs are queued according to service categories **(see col. 4, lines 4-7)** having differing QoS requirements—that is, differing bandwidth requirements.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Prasad with those of Carr et al. such that at least two of the virtual tunnels comprise disparate bandwidths of the transmission media. The motivation being to support multiple VCCs with differing QoS requirements and hence differing services (video, voice, real time data, non-real time, etc.), as taught by Carr et al.

***Allowable Subject Matter***

11. Claims 5-9, 11-13, 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claim 23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 5-9, 11-13, and 23 would be allowable over the prior art of record since the cited references taken individually or in combination fail to particularly disclose a map of port transmission slots, the map comprising: a plurality of hierarchical sets of port transmission slots; the hierarchical sets comprising a plurality of parent sets each

having its port transmission slots divided between a plurality of child set. It is noted that the closest prior art, US-6,556,571 Shahrier et al. discloses a hierarchical method of connecting physical ports in an ATM switch. However, Shahrier et al. fails to disclose or render obvious the above underlined limitations as claimed.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to show the state of the art with respect to data communications networks utilizing ATM technology and more particularly to apparatus and methods for scheduling/shaping multi-service category cell traffic onto virtual-path connections while providing fair share arbitration between aggregating virtual channel connections.:

- US-6,163,542 A Carr et al.
- US-6,665,301 B1 Wu, Guoliang
- US-6,606,302 B2 Delattre et al.
- US-6,198,723 Parruck et al.
- US-6,556,571 Shahrier et al.
- US-6,381,216 Prasad, Sharat
- US-6,611,522 B1 Zheng et al.

The following paper is cited to further show the state of the art with respect to scheduling/shaping multi-service category cell traffic onto virtual-path connections while providing fair share arbitration between aggregating virtual channel connections: Ghani,

N.; Mark, J.W. "Hierarchical scheduling for integrated ABR/VBR services in ATM networks", Nov 1997, Global Telecommunications Conference, GLOBECOM '97., IEEE, Vol.2, Iss., 3-8, Pages: 779-784 vol. 2

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse N. Alexander whose telephone number is (571) 272-3167. The examiner can normally be reached on 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jna3

RICKY NGO
PRIMARY EXAMINER